UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,601	05/09/2001	Timothy W. Skszek	POM-12102/29	2583

7590 02/25/2004

Gifford, Krass, Groh
280 N. Old Woodward Ave., Suite 400
Birmingham, MI 48009

EXAMINER	
FULLER, ERIC B	
ART UNIT	**PAPER NUMBER**
1762	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

14

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 0204

Application Number: 09/851,601
Filing Date: May 09, 2001
Appellant(s): SKSZEK ET AL.

John G. Posa
For Appellant

EXAMINER'S ANSWER

MAILED
FEB 24 2004
GROUP 1700

This is in response to the appeal brief filed November 28, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1 and 2 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

The rejection of claims 3 and 4 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

The rejection of claim 5 independently stands or falls.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,122,564	Koch et al.	9-2000
6,203,861 B1	Kar et al.	3-2001
6,046,426	Jeantette et al.	4-2000
5,875,830	Singer et al.	3-1999

Thompson Steve, HANDBOOK OF MOLD, TOOL AND DIE REPAIR AND DIE REPAIR WELDING, William Andrew Publishing, 1999, pg 21-36.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. (US 6,122,564) in view of Kar et al. (US 6,203,861).

In column 2, lines 36-50, Koch teaches all the limitations to claim 1, except that a first powder is deposited in a first region requiring high thermal or wear resistance and a second powder is deposited in a second region requiring high strength or impact resistance. However, it is taught that the constituency of the powder feed may be varied in accordance with the design criteria (column 6, lines 30-38). Additionally, Kar teaches that designs are known that require the powder composition to be varied such that one region may have high strength and another region may have high thermal resistance. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to vary the composition such that one region may have high strength and another region may have high thermal resistance with a reasonable expectation of success. By doing so, one would have a reasonable expectation of success, since Koch teaches that the powder may be varied according to design criteria and Kar teaches that the design criteria is desired in the art.

The limitations of claim 2 are taught in column 9, lines 50-62.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeantette et al. (US 6,046,426) in view of Kar et al. (US 6,203,861 B1), or vice versa.

Jeanette teaches the limitations of claim 1 in column 2, lines 11-56. Additionally, it is taught that a melt pool may be formed (column 3, lines 55-60), a description of the article is provided to the CAD (column 9, lines 43-45), and that the article is optically

monitored for feedback (column 8, lines 28-40). Jeanette does not explicitly teach that the first powder is deposited in a first region requiring high thermal or wear resistance and a second powder is deposited in a second region requiring high strength or impact resistance. However, Kar teaches that it is known to vary the powder composition such that one region may have high strength and another region may have high thermal conductivity (equivalent to resistance). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to vary the composition such that one region may have high strength and another region may have high thermal resistance with a reasonable expectation of success, since the processes are similar and Kar teaches the modification is desired in the art.

Kar teaches a process of manufacturing 3-D objects by a laser deposition method. Metal particles are directed to the substrate and the laser is used to melt the particles into the object (column 4, lines 7-55). The object created may be a tool for die-casting (column 2, line 61; column 1, lines 55-60). The deposition is graded by depositing different materials in different areas (column 3, line 1-8). A description is provided to a computer controller (column 2, lines 60-63). The physical dimensions of the article are optically monitored for feedback control (column 4, lines 17-20). The reference fails to explicitly teach that a melt pool is formed. However, Jeanette teaches that having powdered material melt in flight versus having the powder fed into a melt pool are obvious variants of each other to one skilled in the art and would result in similar results (column 3, lines 55-60). Therefore, to form a melt pool of in the process of Kar would have been obvious at the time the invention was made to a person having

ordinary skill in the art with an expectation of achieving similar results, as Jeanette teaches this is so.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. (US 6,122,564) in view of Kar et al. (US 6,203,861), as applied to claim 1, and further in view of Singer et al. (US 5,875,830).

Koch, in view of Kar, teaches a method of producing a tool that reads on the limitations of claim 1, as shown above. The references fail to explicitly teach that the tool comprises a gate area and the first material is deposited in relation to the gate area. However, Singer teaches that tools typically comprise gate areas and that materials having high thermal resistance is used in areas around the gate and materials of high strength are used in areas near the working face of the tool (areas where it opens and closes). This is done to increase the life of the tool, as it is resistant to wear and heat damage in the areas where it is most susceptible to these types of damage, and to increase the efficiency of heat transfer during use (column 3, lines 15-41). It would have been obvious to include a gate area and an interface that opens and closes in the tool produced by the above-mentioned references with a reasonable expectation of success, as Singer teaches tools generally comprise these elements. To use the first material in areas around the gate and to use the second material around the interface would have been obvious at the time the invention was made to a person having ordinary skill in the art, as Singer teaches this increases thermal conductivity during use and would act increase the life of the tool.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeantette et al. (US 6,046,426) in view of Kar et al. (US 6,203,861 B1), or vice versa, as applied to claim 1, and further in view of Singer et al. (US 5,875,830).

Jeanette, in view of Kar, or Kar, in view of Jeanette, teach a method of producing a tool that reads on the limitations of claim 1, as shown above. The references fail to explicitly teach that the tool comprises a gate area and the first material is deposited in relation to the gate area. However, Singer teaches that tools typically comprise gate areas and that materials having high thermal resistance is used in areas around the gate and materials of high strength are used in areas near the working face of the tool (areas where it opens and closes). This is done to increase the life of the tool, as it is resistant to wear and heat damage in the areas where it is most susceptible to these types of damage, and to increase the efficiency of heat transfer during use (column 3, lines 15-41). It would have been obvious to include a gate area and an interface that opens and closes in the tool produced by the above-mentioned references with a reasonable expectation of success, as Singer teaches tools generally comprise these elements. To use the first material in areas around the gate and to use the second material around the interface would have been obvious at the time the invention was made to a person having ordinary skill in the art, as Singer teaches this increases thermal conductivity during use and would act increase the life of the tool.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koch et al. (US 6,122,564) in view of Kar et al. (US 6,203,861), as applied to claim 1, and further in view of Singer et al. (US 5,875,830), as applied to claim 3, in view of Thompson (Handbook).

Koch, in view of Kar, in further view of Singer, has shown that it would have been obvious to create a tool that uses a high thermal conductive material in gate areas and a high strength material in non-gate areas, by a process that reads on claim 1. The references fail to teach that first material is H19 steel and the second material is H13 steel. However, Thompson teaches that H19 steel and H13 steel have the characteristics that are desired of the first and second materials, respectively. Therefore, it would have been obvious to use these materials with an expectation of success, as Thompson teaches that these materials possess the desired characteristics.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeantette et al. (US 6,046,426) in view of Kar et al. (US 6,203,861 B1), or vice versa, as applied to claim 1, and further in view of Singer et al. (US 5,875,830), as applied to claim 3, in view of Thompson (Handbook).

Jeanette, in view of Kar, or vice versa, in further view of Singer, has shown that it would have been obvious to create a tool that uses a high thermal conductive material in gate areas and a high strength material in non-gate areas, by a process that reads on claim 1. The references fail to teach that first material is H19 steel and the second

material is H13 steel. However, Thompson teaches that H19 steel and H13 steel have the characteristics that are desired of the first and second materials, respectively. Therefore, it would have been obvious to use these materials with an expectation of success, as Thompson teaches that these materials possess the desired characteristics.

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 20 of Koch et al. (US 6,122,564) in view of Kar et al. (US 6,203,861 B1).

Claim 20 of the patent teaches all the limitations of claim 1 of the present invention, except that a first powder is deposited in a first region requiring high thermal or wear resistance and a second powder is deposited in a second region requiring high strength or impact resistance. However, Kar teaches that designs are known that require the powder composition to be varied such that one region may have high strength and another region may have high thermal resistance. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to vary the composition such that one region may have high strength and another region may have high thermal resistance with a reasonable expectation of success, since both processes are similar and Kar teaches the modification is desired in the art.

(11) Response to Argument

Applicant seeks the opinion of the Board for matters concerning a petition that appears to have never made it to the petitions branch. The examiner notes that the petition is currently under review by the petitions branch.

As to claims 1 and 2, the applicant argues the combination of Jeantette in view of Kar, or vice versa. Pertaining to Jeantette in view of Kar, applicant argues that the feedback system of Jeantette is very different from that of the appellants. The applicant states that the claims are drawn to the physical dimension being optically monitored and automatically controlling the physical dimension in accordance with the description of an article to be fabricated. The applicant alleges that Jeantette does not read on this. The examiner disagrees with this argument.

In response, the examiner points out that Jeantette explicitly teaches providing a description of the article to a computer that automatically controls the physical dimension in accordance with this description (column 9, lines 43-67) and clearly teaches a feedback loop (column 10, lines 26-30). It is noted that the applicant's claims do not require that the optical monitoring be associated with the feedback loop nor the automatic controlling of the physical dimension. Therefore, "optically monitoring the physical dimension" simply reads on looking at the article produced, which would not patentably differ the applicant's claims from the process taught by Jeantette.

Regardless, Jeantette teaches a laser triangulation device used to verify layer thickness in-situ (column 8, line 28 - column 9, line 5). The devices allows for real-time, <u>position-sensing</u> data to be used to correct for variations in <u>layer thickness</u>, and provide

a further signal for <u>closed-loop process control</u>. The triangulation system, using a diode laser (light) and optical filter, reads on being an optical device. Since the device is verifying layer thickness in-situ and has an output signal proportional to the height of the forming structure, the optical device is being used to monitor a physical dimension. At best, it appears that the applicant is arguing that the device in Jeantette indirectly monitors the physical dimension by determining it from other factors, while the applicant directly monitors the physical dimension. However, the applicant's claim language does not support this argument. Furthermore, Jeantette teaches position-sensing data from a triangulation device for in-situ determination of layer thickness, which reads on directly monitoring the physical dimension.

Pertaining to Kar in view of Jeantette, the applicant argues that Kar fails to teach optical feedback. The examiner disagrees. As noted above, the claims do not require "optical feedback", only optical monitoring, and possibly a feedback loop of some sort. Although the claims do label the process as "a feedback-controlled laser-assisted direct metal deposition process", there are no limitation steps requiring feedback control. The claims read that the "feedback-controlled laser assisted direct metal deposition process" includes the steps of optically monitoring a physical dimension and automatically controlling the physical dimension in accordance with <u>the description of the article to be fabricated</u>. There is no indication of the optical monitoring being a part of the feedback loop or that the article is fabricated based on feedback.

Regardless, Kar teaches that the invention can be connected to a visual feature (optical) and geometry recognition system (monitoring physical dimension) which records, examines, slices, and runs the computer-controlled system (feedback control) for parts creation (column 4, lines 17-20).

The applicant further argues the combination of Kar with Jeantette, which is relied upon to teach the forming of a melt pool. Applicant argues that if the proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims obvious. Applicant argues that the lack of a melt pool is technically justified in Kar and therefore would change the principle of operation, defeating obviousness. The examiner disagrees.

In response, it is pointed out that the only teaching in Kar of not forming a melt pool is in a specific, alternate embodiment in which the article formed is to be separated from the substrate (column 8, lines 30-42). For all other embodiments taught by Kar, the coating powder is melted in a region located on the substrate in order to form a bond (abstract). Therefore, Kar seems to be teaching the formation of a melt pool for these embodiments. However, since this is not entirely clear, the examiner has provided Jeantette as showing that having the particles melt in an areas just above the substrate versus having the powder be fed into a melt pool are obvious variants of each other to one skilled in the art and would result in similar results (column 3, lines 55-60). From the teaching of similar results, Jeantette has taught that the modification of using

a melt pool would not change the principle of operation of the embodiments of Kar that involve forming a bonded article.

Applicant argues the combination of Koch in view of Kar. The applicant argues that there is no teaching or suggestion in the prior art to combine these references. The examiner disagrees. Koch explicitly teaches that "the constituency of the powder feed may be varied in accordance with design criteria" (column 6, lines 34-36). This is an explicit teaching that the invention is capable of producing parts of multiple design criteria. Kar teaches desirable design criteria that involve varying the powder composition such that one region may have high strength and another region may have high thermal resistance. The motivation to combine has been taken directly from the prior art. Koch teaches to vary the composition if the design criteria desire it and Kar teaches a design criterion that desires it.

As to claims 3 and 4, the applicant argues that there is no motivation in Singer to use the process of Koch, Jeantette, or Kar to form the tool of Singer. The examiner acknowledges this argument. However, this argument does not pertain to the rejection of the final rejection. In the previous action (Paper No. 10), the examiner does not suggest forming the tool of Singer by the processes of Koch, Kar, and/or Jeantette. On the contrary, the examiner shows how it would have been obvious at the time the invention was made to a person having ordinary skill in the art to include a gate area and an interface in the tools that are being produced by the processes of Koch, Kar,

and/or Jeantette. The applicant has argued Singer in view of Koch, Kar, and/or Jeantette, not the rejection of record, which is Koch, Kar, and/or Jeantette in view of Singer. The motivation to include a gate area and an interface in the tools of the above-mentioned processes is explicitly taught by Singer. Singer teaches that tools typically comprise these elements in order to function as tools. Singer additionally teaches that by using a material of high thermal resistance in the gate areas and materials of high strength are used near the interface in order to increase the life of the tool (column 3, lines 15-41). To summarize the examiner's rejection, the above-mentioned processes (Koch, Kar, and/or Jeantette, in their respective combinations) all teach forming tools by depositing materials of high strength in certain areas and materials of high thermal resistance in others, but are silent to where which areas of the tool require which type of material. Singer makes up for these deficiencies by teaching which areas require high thermal resistance (gate) or high strength (interface) in a typical tool. The motivation to combine is the increased life of the tool.

With respect to claim 5, the applicant argues that obviousness of the proposed rejections does not exist in the prior art. The examiner disagrees. As noted above, Singer explicitly teaches which areas of a tool require high strength and which areas require high thermal resistance. Thompson teaches that H13 steel has the characteristic of high strength (as it is used in die casting, page 24). Thompson teaches that H19 has the characteristic of high thermal resistance (as it is used for hot working extrusion, page 25). To use steels with the desired characteristic in their corresponding

locations in the tool, as taught by Singer, would have been obvious. By doing so, one would have a reasonable expectation of success as Singer teaches to use materials of certain characteristics in certain locations and Thompson teaches which steels have these characteristics.

With respect to claim 1, the applicant argues the combination of Koch in view of Kar, as it pertains to the obviousness-type double patenting rejection. These arguments parallel the arguments all ready given above. The examiner disagrees for the same reasons given above.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Eric B Fuller
February 18, 2004

Conferees
Shrive Beck
Glenn Caldarola

SHRIVE P. BECK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Gifford, Krass, Groh
280 N. Old Woodward Ave., Suite 400
Birmingham, MI 48009

Glenn Caldarola
Supervisory Patent Examiner
Technology Center